P0RSF
11.3.31.5.1 V2

centurywest
ENGINEERING CORPORATION

December 1, 1995

Mr. Pad Quinn
Port of Portland
PO Box 3529
Portland, Oregon 97208

RE: Sampling and Analysis of Fill Soil for Terminal 5
Rivergate Industrial District
Portland, Oregon

Dear Pad:

Century West Engineering Corporation (Century West) was retained by the Port of Portland to perform soil sampling of fill material to be used at the Port of Portland's Marine Terminal 5. The investigation of potential contamination of petroleum hydrocarbons, metals, and volatile organics consisted of obtaining representative composite soil samples from approximately 200,000 cubic yards of soil staged at seven locations in the Rivergate Industrial District.

This letter report presents sample locations and collection activities and analytical test results compared to the Oregon Soil Cleanup Table presented as Appendix 1 in the Oregon Department of Environmental Quality's (DEQ) Soil Cleanup Table (OAR 340-122-045 and 046).

Soil Sample Locations and Activities

The focus of the fill sampling program was to collect chemical and physical data to explore the presence of petroleum hydrocarbons, total organic halogens, and total metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) in composite soil samples collected from seven fill sources. One composite soil sample, consisting of soil from four locations, was obtained for each approximated 10,000 cubic yards.

The fill sources were all located within the Rivergate Industrial District on properties owned by the Port of Portland. Each fill source location was identified numerically as Site 1 through Site 7 (Figure 1) and contained varying amounts of fill material. Figures 2 through 8 show Sites 1 through 7, respectively, and soil sampling locations. Each site was divided into sections approximately 10,000 cubic yards in volume and labeled alphabetically. One composite soil sample was obtained from each section. Soil samples were labeled according to which site and which section of the site they were obtained (e.g., Sample S-1A was obtained from site 1, section A). Table 1, attached, describes each of the sites, including a brief description of the soil types and approximately depths tat the samples were obtained.

825 N.E. Multnomah, Suite 425 Portland, Oregon 97232 Phone: (503) 231-6078 FAX: (503) 231-6482

Sample Collection Procedures

Century West implemented the Port of Portland's Sampling and Analysis Plan - Fill Sources for Terminal 5, dated July 1995. Composite samples were obtained by approximating 10,000 cubic yards, spacing four stakes within that volume, and collecting a soil sample and headspace sample from each location into laboratory-prepared sample containers. The four soil samples were then mixed in a decontaminated stainless steel bowl and placed into a clean, laboratory-prepared container. Soil samples were collected at depths varying from one-half to four feet.

Samples collected were screened in the field for visual indications of petroleum hydrocarbons and were subjected to a headspace test with a photoionization detector (PID) to assess the possible presence of volatile organic compounds. The headspace test was conducted by placing soil from each discrete sampling location into glass jars (filled less than half full), covered with aluminum foil prior to capping, and allowing to warm to room temperature. Measurements were made within one-half hour of collection by pushing the PID probe through the foil cover. The PID was calibrated using a manufacturer supplied standard gas. The headspace readings were used to determine if analysis for halogenated solvents was necessary.

A chain-of-custody record was used to track possession of each sample and document the requested analyses. The chain-of-custody record accompanied the samples from sample preparation to sample analysis.

To minimize the potential for cross-contamination, all sampling equipment was cleaned before each sample collection. The decontamination procedure consisted of washing with an Alconox® solution, rinsing with tap water, and rinsing with distilled water.

Analytical Testing and Results

All of the composite soil samples were submitted for analysis for total petroleum hydrocarbons (TPH) identification using Oregon DEQ Method TPH-HCID and for total metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) using EPA Methods 6010 and 7470. Analytical test results did not reveal TPH in any of the soil samples. Headspace readings for all of the samples were zero. Therefore, in accordance with the Port's directions, none of the samples were submitted for halogenated organics analysis. Table 2, attached, summarizes the analytical test results for total metals and includes cleanup levels for Industrial Sites from DEQ's Soil Cleanup Manual, Appendix 1. Analytical laboratory reports are included as an attachment.

Concentrations of barium, chromium, lead, mercury, selenium, and silver are well below cleanup

levels for industrial. Cadmium was not detected in any of the soil samples. Arsenic was detected at concentrations slightly above the industrial cleanup level of 3 ppm in soils at site 2 and site 3. The highest detected concentration of arsenic was 4.07 ppm and was obtained from site 3. Arsenic is a common background element in this area and, given the low levels of arsenic detected, Century West recommends no further action regarding the soil at sites 2 and 3.

This recommendation is supported by Century West's Remedial Investigation/Feasibility Study (RI/FS) for the Schnitzer Moody Avenue property, dated May 1990, and the South Waterfront Redevelopment Area, dated October 2, 1992 (Figure 9). The projects included collection of twenty two soil samples from investigative borings and test pits for analysis for total metals. Statistical analysis of the test data established a background level for arsenic of 46.0 ppm for the Schnitzer Moody Avenue property. The DEQ requested additional supporting data for the arsenic background level for the South Waterfront Area. The data used to calculate the arsenic background concentration of 46.0 ppm was re-analyzed in accordance with EPA guidelines to verify that there were no outliers in the data set. As recommended by the DEQ, the arithmetic mean of the arsenic data, plus two standard deviations were used to establish the upper bound of the arsenic data at the 95 percent confidence level. Based on this statistical analysis, 36.1 ppm was established as the background for arsenic in soil.

Please call the undersigned at (503) 231-6078 if you have any questions regarding this project.

Sincerely,

Alice J. Larsen
Project Manager

Thomas B. Gainer, P.E.
Senior Environmental Engineer

Attachments:

Table 1 - Fill Source Sampling Sites
Table 2 - Analytical Test Results - Total Metals

Figure 1 - Site Vicinity Map
Figure 2 - Site 1
Figure 3 - Site 2
Figure 4 - Site 3
Figure 5 - Site 4

Figure 6 - Site 5
Figure 7 - Site 6
Figure 8 - Site 7
Figure 9 - Schnitzer Moody and South Waterfront Projects

Analytical Laboratory Reports

TABLES

TABLE 1
FILL SOURCE SAMPLING SITES

Port of Portland
Rivergate Industrial District
Portland, Oregon

Fill Source Identification	*Site Location*	*Cubic Yards*	*No. of Samples*	*Comments*
Site 1	On the south site of North Marine Drive between North Bybee Lake and NW Factory Group, Inc.	50,000	5	Fill material consisted of loose, gray, medium sand and was stockpiled on the site. Samples from the top of the pile to were obtained 2 to 4 feet below ground surface (bgs). Soil samples along the south side of the pile were obtained 7 to 12 feet from the top of the pile.
Site 2	Just inside and to the north of the gates to Western Transportation on North Rivergate Blvd	35,000	2	Fill material consisted of brown, hard, fine to medium sands. The material was above-grade and covered with vegetation. Soil samples were collected between 1 and 4-½ feet bgs.
Site 3	Under transmission power lines on both sides of Time Oil Road, just south of Western Transportation	100,000	10	Fill on west side of road consisted of unearthed sandy soils on a future wetland mitigation site. Unearthed sandy soil with barkdust to 8 inches in some areas was sampled on the east side of the road. Soil samples were obtained between ½ and 3-½ feet bgs.
Site 4	On North Lombard Street, across from Land O'Lakes	50,000	5	Approximately one-half of fill was stockpiled and the rest was surface scrapings. All of the soil consisted of loose, gray, well-sorted sand. Soil samples were obtained ½ to 3 feet bgs in the surface scrapings. The soils obtained from the pile were collected between 1 and 6 feet from the top of the pile.
Site 5	North of Access Road to Terminal 5	15,000	2	Fill material consisted of loose, sandy soils. The material was above-grade and covered with vegetation. Soil samples were obtained from depths between 2 and 5 bgs.

TABLE 1 (Cont.)
FILL SOURCE SAMPLING SITES

Port of Portland
Rivergate Industrial District
Portland, Oregon

Fill Source Identification	*Site Location*	*Cubic Yards*	*No. of Samples*	*Comments*
Site 6	South corner of Terminal 5, near Oregon Steel Mill's lagoon and Union Pacific railroad	15,000	2	Most of the fill was loose, gray medium sand. Some was gravel ½" minus and sand. Most of the fill was stockpiled in several small piles and one large pile. The rest was spread around. Samples were collected from selected piles approximately 3 feet below the top of the pile. Samples were obtained from ½ to 2-1/2 feet below grade in the soil that was spread around.
Site 7	Future extension of North Leadbetter Road	15,000	2	Fill was loose, brown, sandy surface scrapings. Soil samples were obtained from the surface down to approximately 1 foot below grade.

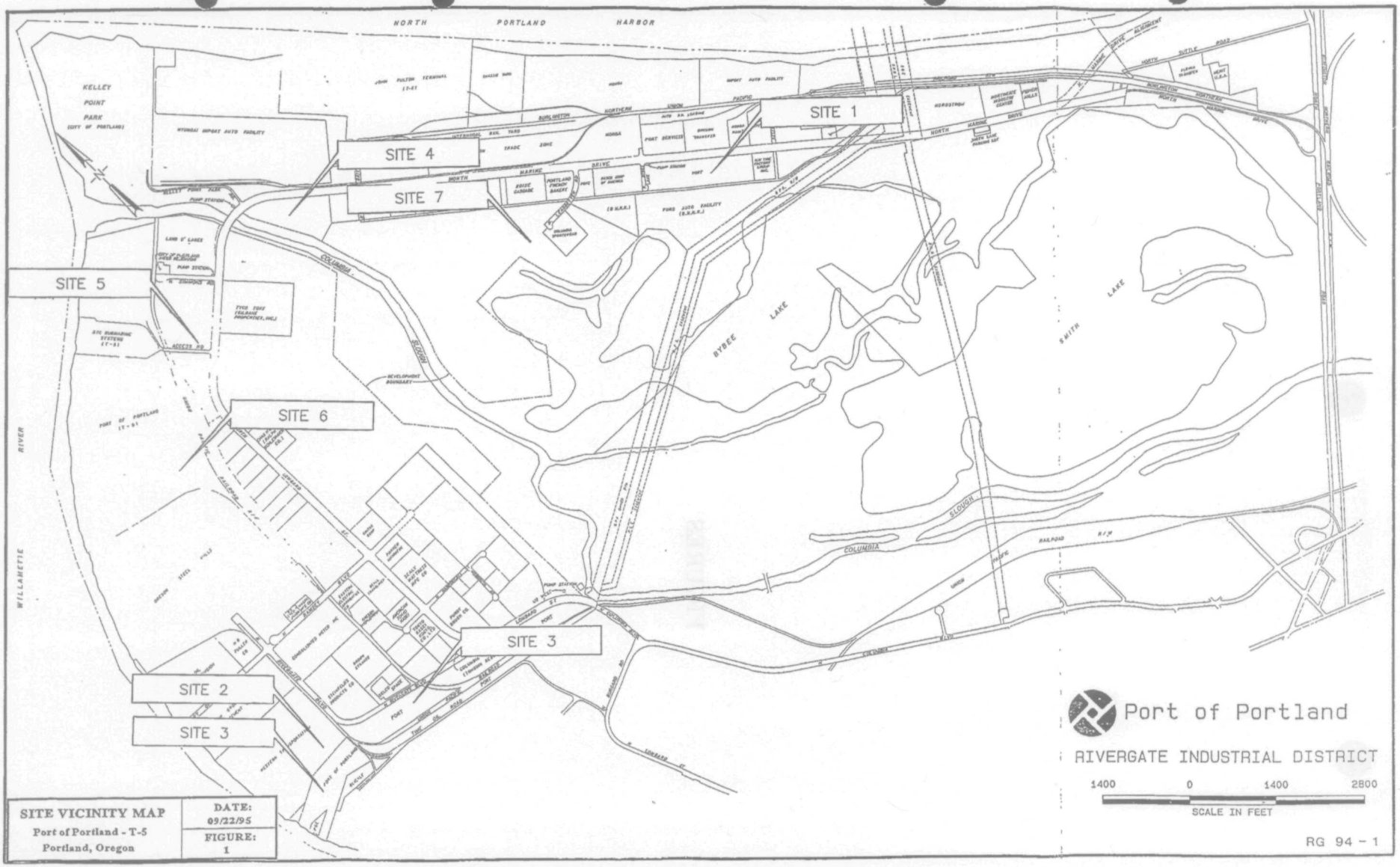
TABLE 2
ANALYTICAL TEST RESULTS - TOTAL METALS

Port of Portland
Rivergate Industrial District
Portland, Oregon

Sample Identification	Concentration in Parts per Million (ppm)							
	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
S-1A	1.56	47.9	<0.2	10.6	<2.5	<0.02	<5.0	<0.3
S-1B	1.52	54.4	<0.2	10.2	3.4	0.02	<5.0	<0.3
S-1C	1.56	62.8	<0.2	11.2	<2.5	<0.02	<5.0	<0.3
S-1D	1.83	59.7	<0.2	11.4	<2.5	<0.02	<5.0	<0.3
S-1E	1.74	50	<0.2	9.22	2.6	<0.02	<5.0	<0.3
S-2A	3.6	74.5	<0.2	14.7	8	0.024	<5.0	<0.3
S-2B	3.67	84.6	<0.2	17.1	6.6	<0.02	<5.0	<0.3
S-3A	4	79.8	<0.2	17.2	5.6	0.021	<5.0	<0.3
S-3B	3.65	69.7	<0.2	17.5	6.4	0.021	<5.0	<0.3
S-3C	2.9	71.2	<0.2	11.8	5.3	0.023	<5.0	<0.3
S-3D	2.9	54.5	<0.2	11.8	2.7	0.021	<5.0	<0.3
S-3E	3.2	80.8	<0.2	13.4	5.9	0.036	<5.0	<0.3
S-3F	3.97	83.8	<0.2	18	6	0.023	<5.0	<0.3
S-3G	3.71	74	<0.2	14.5	4.08	<0.02	<5.0	<0.3
S-3H	3.94	81.9	<0.2	15.9	6.9	0.032	<5.0	<0.3
S-3I	4.07	82.4	<0.2	16.5	3.3	0.024	<5.0	<0.3
S-3J	3.92	80.8	<0.2	16.1	3.9	<0.02	<5.0	<0.3
S-3Z								
(Duplicate of S-3G)	3.7	79.8	<0.2	15.2	5.4	<0.02	<5.0	<0.3
S-4A	1.5	55.2	<0.2	10.6	<2.5	<0.02	<5.0	<0.3
S-4B	1.7	59.8	<0.2	11.8	<2.5	<0.02	<5.0	<0.3
S-4C	1.6	49.7	<0.2	12.1	<2.5	<0.02	<5.0	<0.3
S-4D	1.5	49.4	<0.2	8.88	<2.5	<0.02	<5.0	<0.3
S-4E	1.4	56.4	<0.2	13.8	3.2	<0.02	<5.0	<0.3
S-4Z								
(Duplicate of S-4D)	1.5	50.4	<0.2	9.75	<2.5	<0.02	<5.0	<0.3
S-5A	1.5	65.9	<0.2	13.7	3.3	<0.02	<5.0	<0.3
S-5B	1.3	83.8	<0.2	22	4	0.022	<5.0	<0.3
S-6A	1.8	43.1	<0.2	10.3	3.5	0.02	<5.0	<0.3
S-6B	1	90.8	<0.2	13.6	5	0.023	<5.0	<0.3
S-7A	1.5	92.3	<0.2	7.43	2.8	0.025	<5.0	<0.3
S-7B	1.9	74	<0.2	11.3	4.9	<0.02	<5.0	<0.3
	Soil Cleanup Levels in ppm (OAR 340-122-045)							
Industrial Sites	3	140,000	1.00	1,000	1,500	2,000	600	10,000

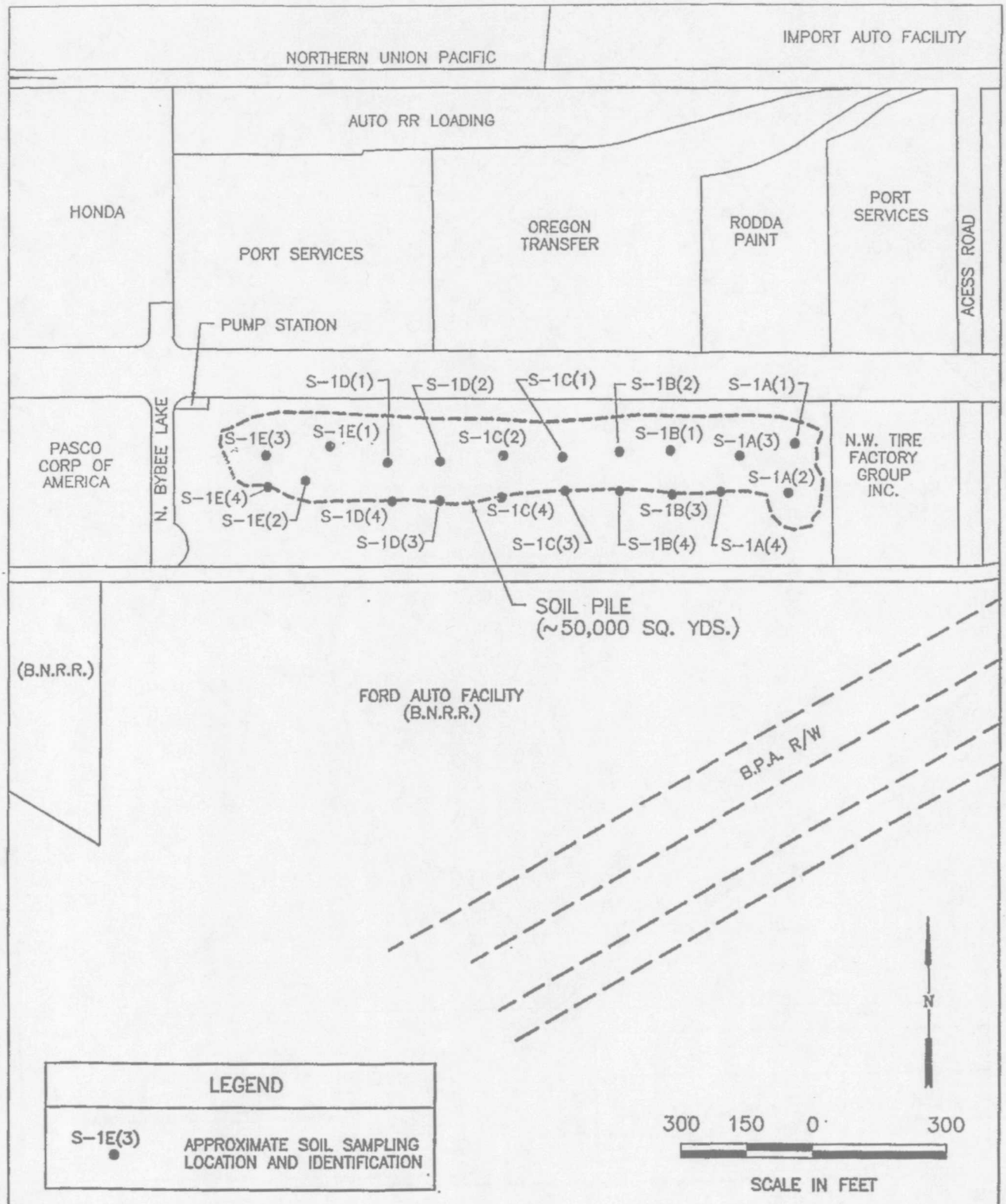
Notes:
Total Metals performed using EPA Method 6010 and 7470.
Sample Identification indicates sampling site number which section of the site the sample was obtained (see Figures 1 through 8).
"<" means less than.
Soil Cleanup Levels are from DEQ's Soil Cleanup Manual Table, Appendix 1.

FIGURES



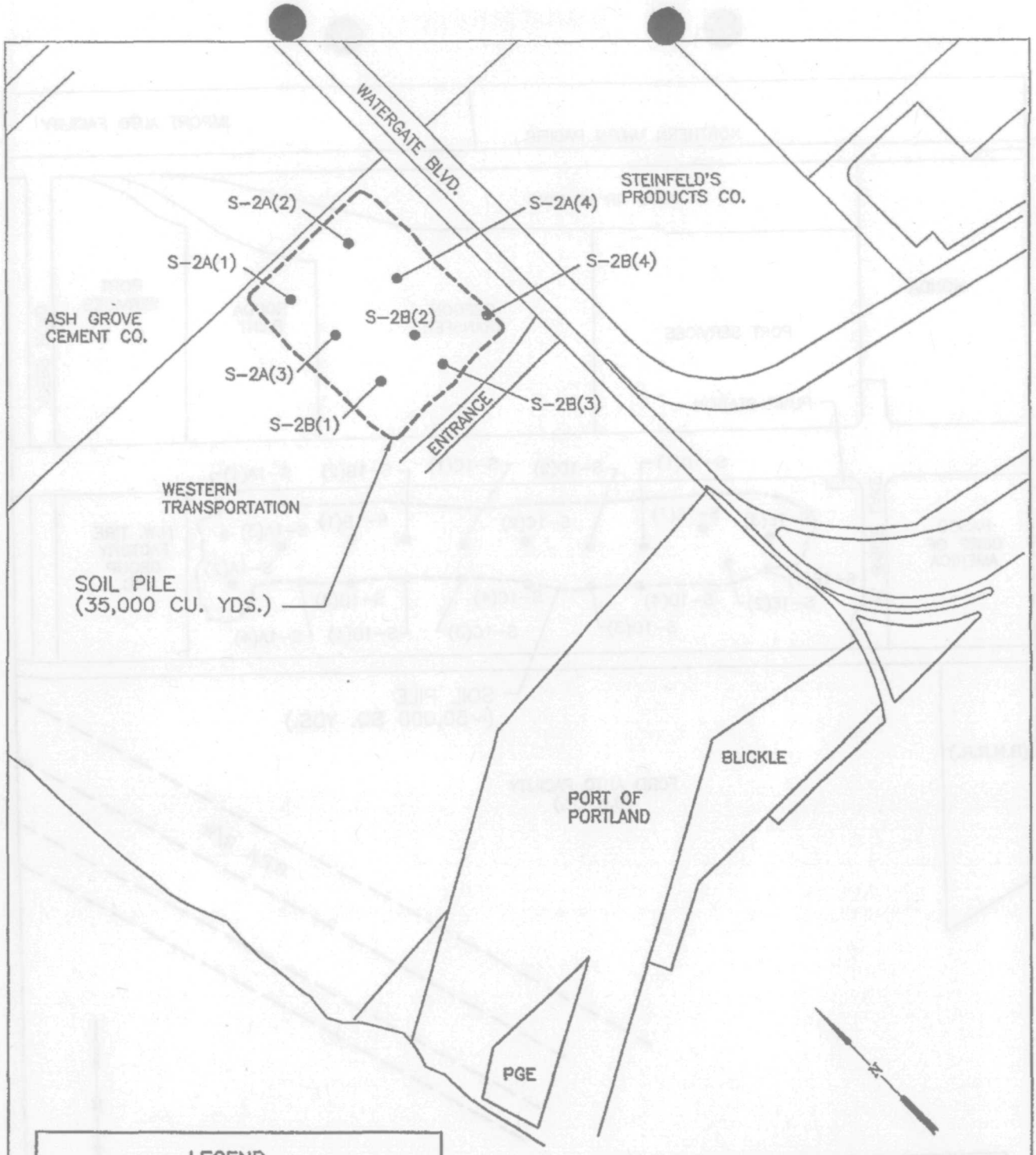
SITE VICINITY MAP Port of Portland - T-5 Portland, Oregon	DATE: 09/22/95
	FIGURE: 1

OSM009810



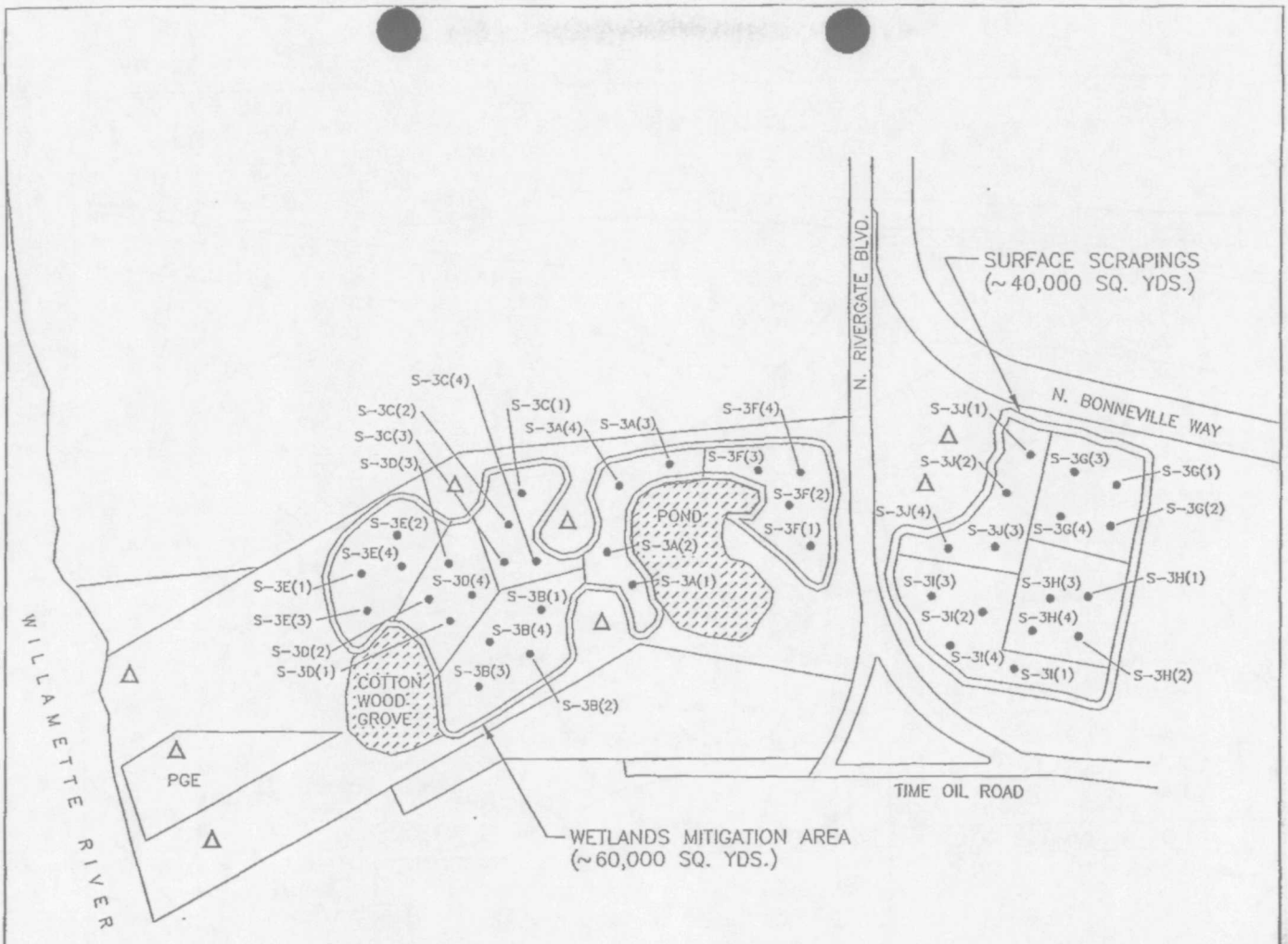
DESIGNED BY: AL	CHECKED BY:	SITE 1 PORT OF PORTLAND T-5 PORTLAND, OREGON	centurywest ENGINEERING CORPORATION	DATE: 09/14/95
DRAWN BY: DMC	SCALE: AS SHOWN			FIGURE: 2
FILE: 40038101\01\3129\30ZF2				

OSM009811



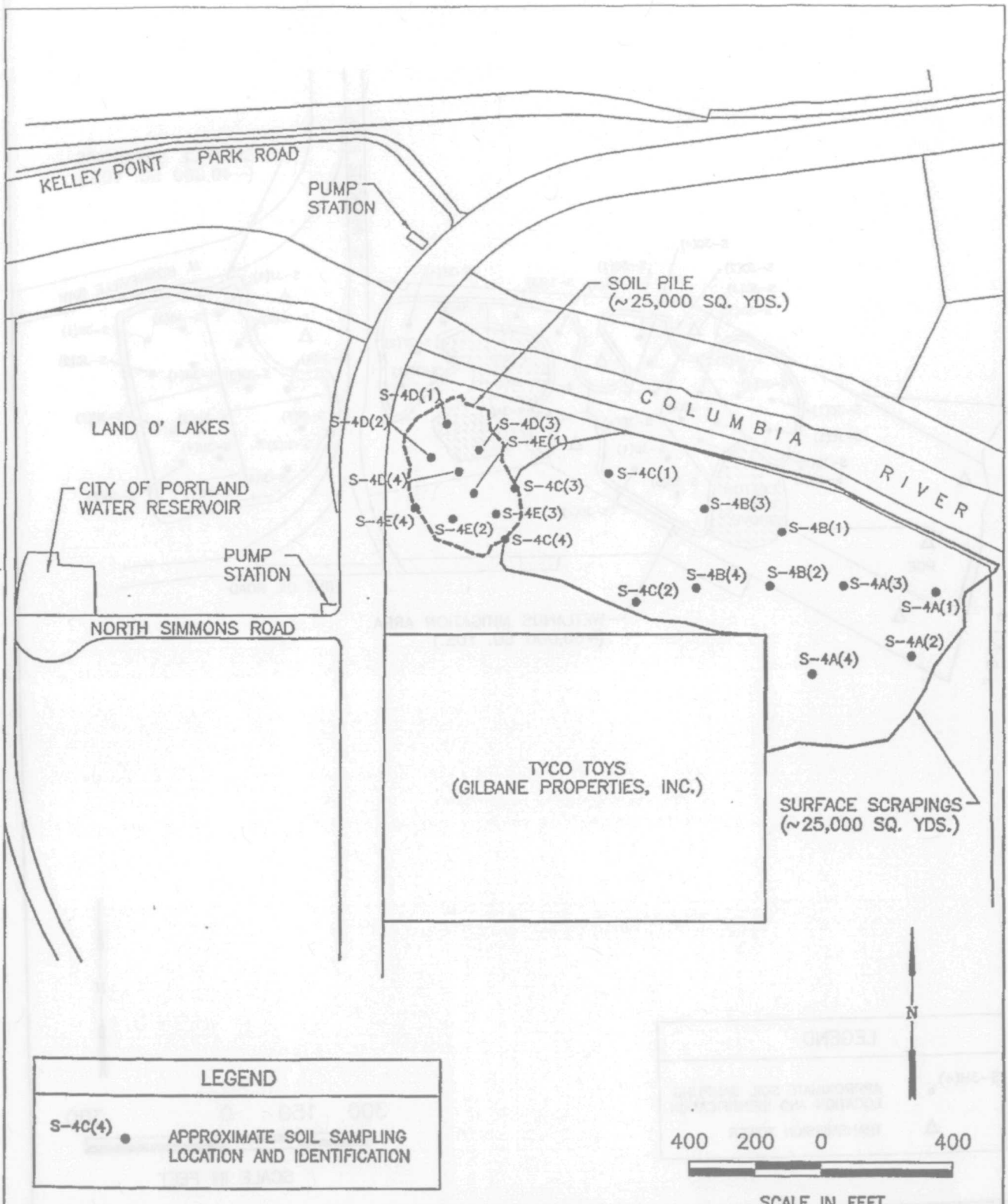
DESIGNED BY: AL	CHECKED BY:	SITE 2 PORT OF PORTLAND T-5 PORTLAND, OREGON	DATE: 11/30/95
DRAWN BY: DMC	SCALE: AS SHOWN	centurywest ENGINEERING CORPORATION	FIGURE: 3
FILE: 40038101\01\3129\48JFIG3			

OSM009812



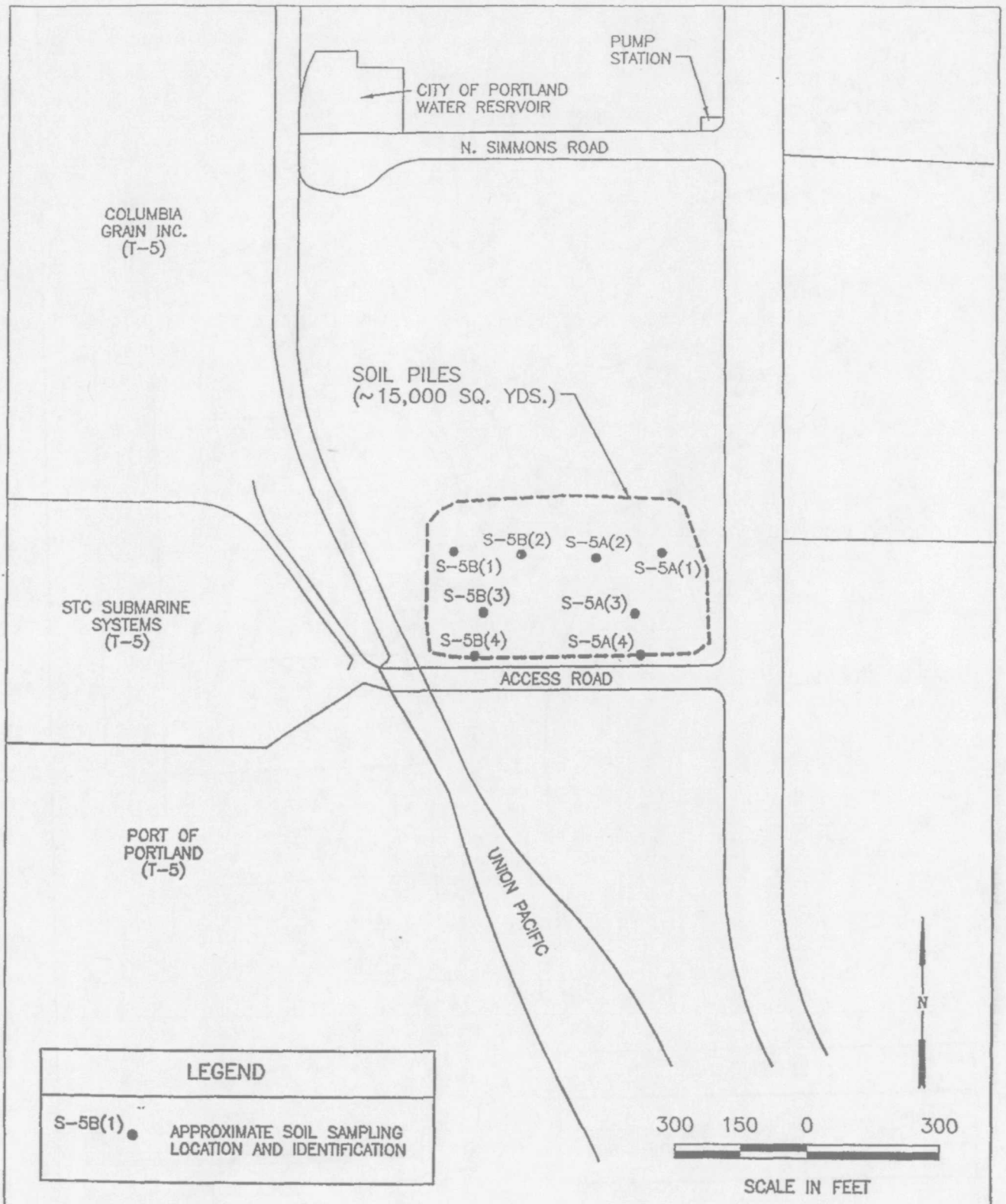
LEGEND	
S-3H(4) ●	APPROXIMATE SOIL SAMPLING LOCATION AND IDENTIFICATION
△	TRANSMISSION TOWER

DESIGNED BY: AL	CHECKED BY:	SITE 3 PORT OF PORTLAND T-5 PORTLAND, OREGON	centurywest ENGINEERING CORPORATION	DATE: 09/14/95
DRAWN BY: DMC	SCALE: AS SHOWN			FIGURE: 4
FILE: 40038101\01\3129\3P8F4				



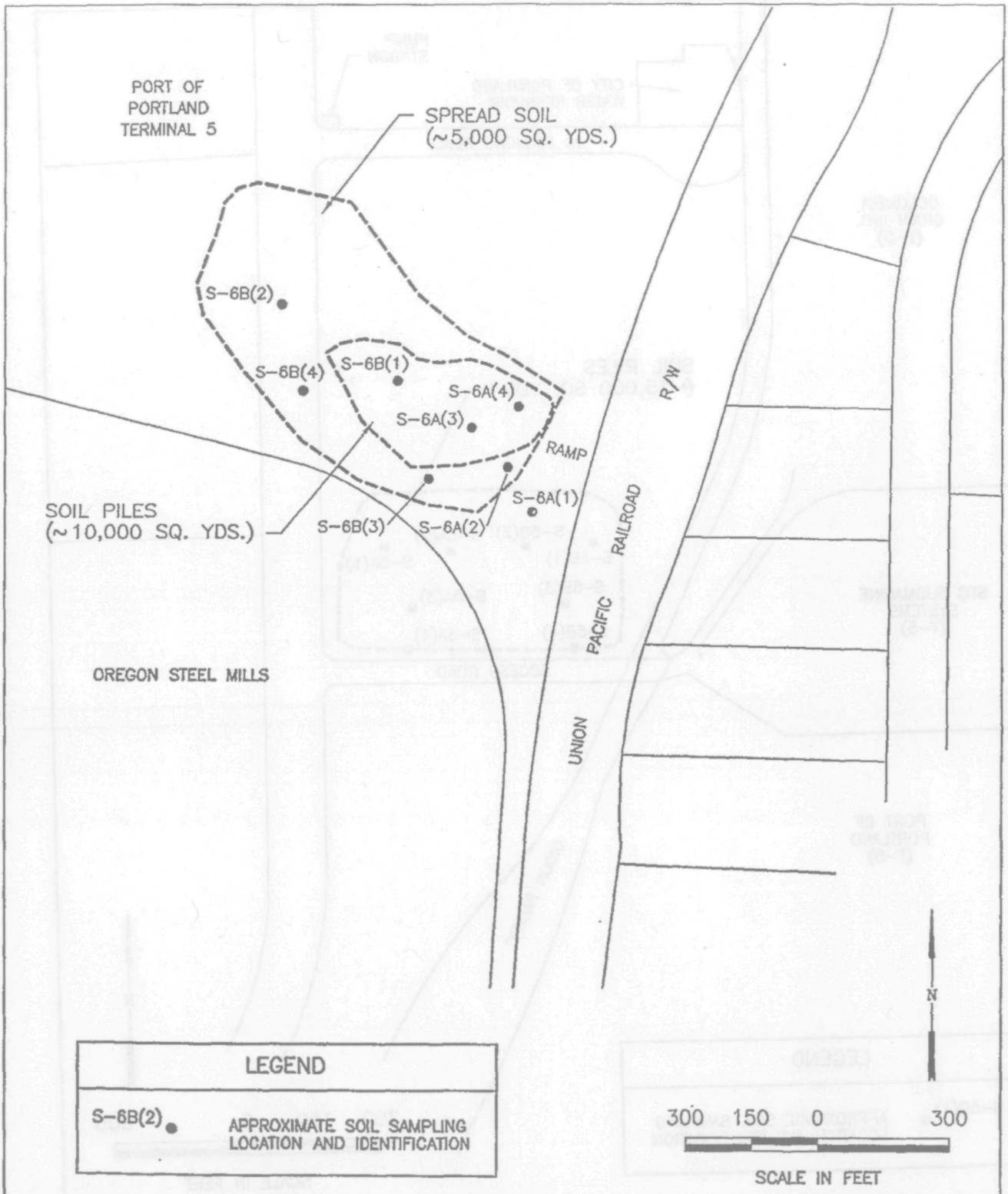
DESIGNED BY: AL	CHECKED BY:	SITE 4 PORT OF PORTLAND T-5 PORTLAND, OREGON	centurywest ENGINEERING CORPORATION	DATE: 09/14/95
DRAWN BY: DMC	SCALE: AS SHOWN			FIGURE: 5
FILE: 40038101\01\3129\3PBF5				

OSM009814



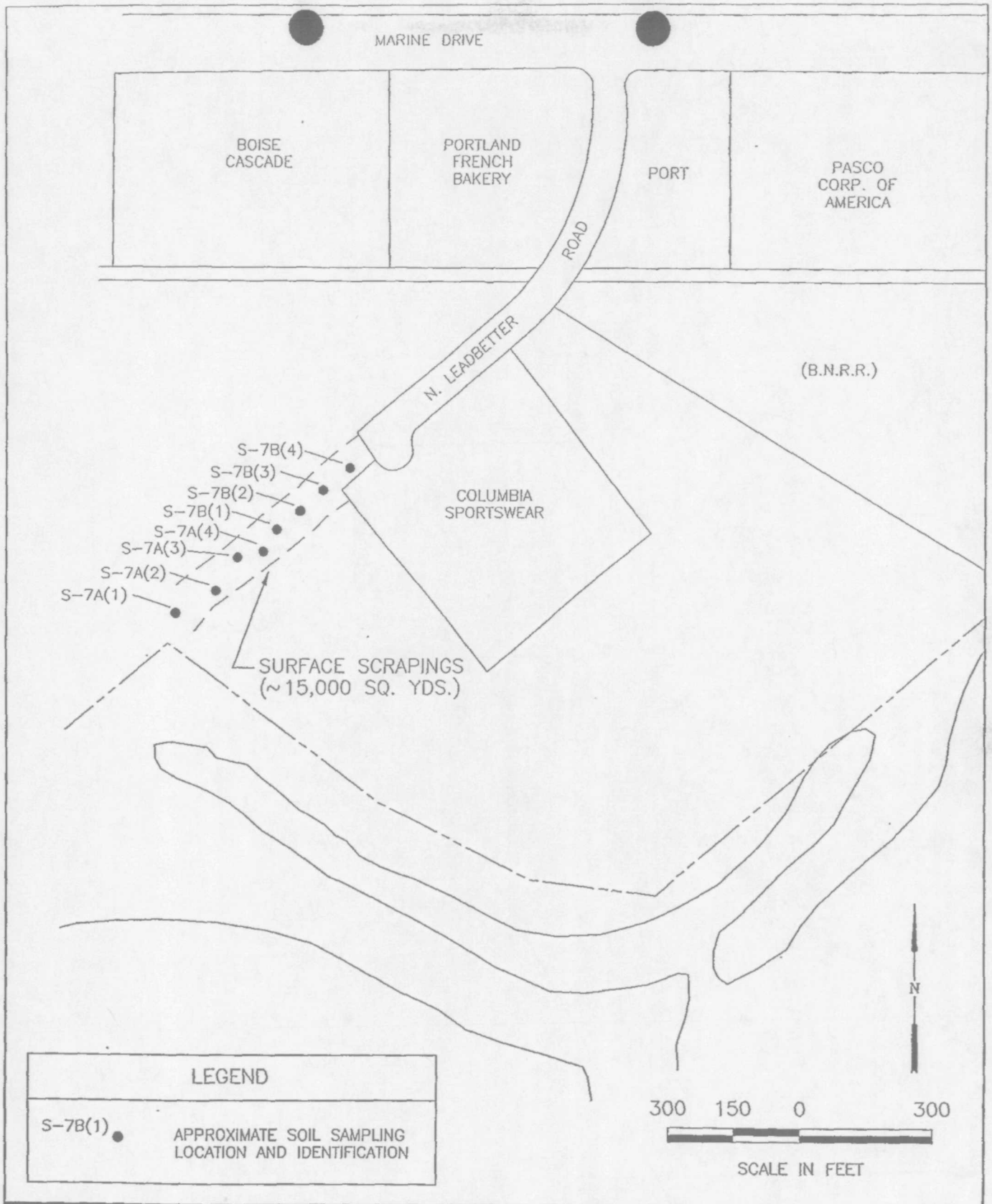
DESIGNED BY: AL	CHECKED BY:	SITE 5 PORT OF PORTLAND T-5 PORTLAND, OREGON	centurywest ENGINEERING CORPORATION	DATE: 09/14/95
DRAWN BY: DMC	SCALE: AS SHOWN			FIGURE: 6
FILE: 40038101\01\3129\3PPF6				

OSM009815



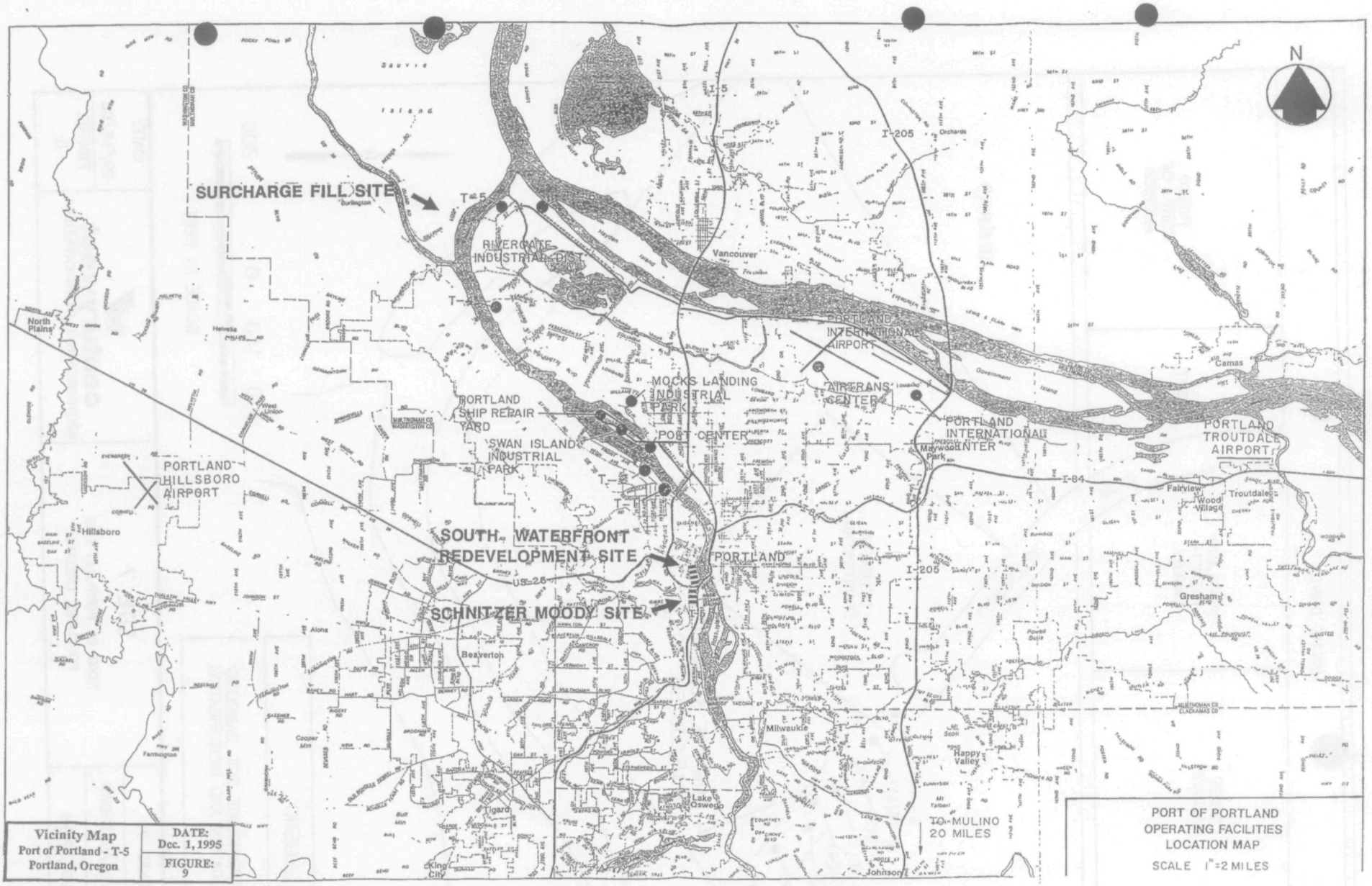
DESIGNED BY: AL	CHECKED BY:	SITE 6	centurywest ENGINEERING CORPORATION	DATE: 09/14/95
DRAWN BY: DMC	SCALE: AS SHOWN	PORT OF PORTLAND T-5 PORTLAND, OREGON		FIGURE: 7
FILE: 40038101\01\3129\3PCF7				

OSM009816



DESIGNED BY: AL	CHECKED BY:	SITE 7 PORT OF PORTLAND T-5 PORTLAND, OREGON	centurywest ENGINEERING CORPORATION	DATE: 09/14/95
DRAWN BY: DMC	SCALE: AS SHOWN			FIGURE: 8
FILE: 40038101\01\3129\3PHF8				

OSM009817



Vicinity Map Port of Portland - T-5 Portland, Oregon	DATE: Dec. 1, 1995
	FIGURE: 9

OSM009818

ANALYTICAL LABORATORY REPORTS

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: RJ DATE: 8/1/95

DATA PACK REVIEW BY: JB DATE: 8/1/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	S-1A	S-1B	S-1C	S-1D	S-1E
OAL ID: 25-I687-	39342	39343	39344	39345	39346
SAMPLE DATE:	7/27/95	7/27/95	7/27/95	7/27/95	7/27/95
MATRIX:	SOIL	SOIL	SOIL	SOIL	SOIL
EXTRACTION DATE:	7/28/95	7/28/95	7/28/95	7/28/95	7/28/95
ANALYSIS DATE:	7/30/95	7/30/95	7/30/95	7/30/95	7/30/95
HCID:	ND	ND	ND	ND	ND
HCID(CONTINUED):	.	.	.	.	.
SURR.RECOVERY %	99.	101.	110.	110.	117.
ANALYST:	RJ	RJ	RJ	RJ	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: DMC2 DATE: 8-1-95

DATA PACK REVIEW BY: KMB DATE: 8/1/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

TOTAL METALS
EPA METHODS 6010 AND 7470

SAMPLE ID:		S-1A	S-1B	S-1C	S-1D	S-1E
OAL ID: 25-I687-		39342	39343	39344	39345	39346
SAMPLE DATE:		7/27/95	7/27/95	7/27/95	7/27/95	7/27/95
DIGESTION DATE:		7/31/95	7/31/95	7/31/95	7/31/95	7/31/95
ARSENIC	PPM	1.56	1.52	1.56	1.83	1.74
BARIUM	PPM	47.9 *	54.4*	62.8 *	59.7 *	50.0 *
CADMIUM	PPM	<0.2	<0.2	<0.2	<0.2	<0.2
CHROMIUM	PPM	10.6	10.2	11.2	11.4	9.22
LEAD	PPM	<2.5	3.4	<2.5	<2.5	2.6
MERCURY	PPM	<0.02	0.022	<0.02	<0.02	<0.02
SELENIUM	PPM	<5.0	<5.0	<5.0	<5.0	<5.0
SILVER	PPM	<0.3	<0.3	<0.3	<0.3	<0.3

NA = NOT ANALYZED

* Spike recovery outside Q.C. limits. Post spike within limits.

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL Oregon Analytical Laboratory

14855 S.W. Old Scholls Ferry Rd.
Beaverton, Oregon 97007
(503) 590-5300
FAX (503) 590-1404

CHAIN OF CUSTODY RECORD
LABORATORY ANALYSIS REQUEST

Client Information

Company: Century West
Contact: Alice Larsen
Address:
Phone #: 231-6078 FAX #:

Project Name: Port-Surcharge Samples
Project Number: 40038-101-01
P.O. Number:
Comments: BILL PORT

Sampler's Name: Alice Larsen
Signature: [signature]
Sampling Date: 7/27/95

Provide Verbal Results ☑ Yes ☐ No
Provide FAX Results ☑ Yes ☐ No

Turnaround: N - 2 weeks; S - 1 week; (R - Rush) (circled); O - Other

	SAMPLE IDENTIFICATION	DATE	TIME	OAL # 25-I687	# of Containers	Soil	Water	Other (Note in Remarks)	Volatiles 624/8260 (circle) All Aromatic Halogenated	Semivolatiles 625/8270 (circle) All PAH(SIM) Phenol Phthalate	Organochlorinateds 608/8080 All PCB Pesticide (circle)	Chlorinated Herbicides 8150	TPH-HCID OR-DEQ Quantify? Yes No	TPH Quantification (circle) G D 418.1M 418.1	BTEX 602/8020	TCLP Metals (circle) As Ba Cd Cr Pb Hg Se Ag	TCLP Organics (circle) Vol Semivol Pest Herb	Metals ☐Dissolved ☒Total 1st 5 RCRA				Turnaround	REMARKS
1	S-1A	7/27/95		39342	2								X					X					
2	S-1B			39343	2								X					X					
3	S-1C			39344	2								X					X					
4	S-1D			39345	2								X					X					
5	S-E			39346	2								X					X					
6																							
7																							
8																							
9																							
10																							

Relinquished
Signature: [signature] Date: 7/28/95
Print Name: Century West Time: 10:00
Company:

Received
Signature: Date:
Print Name: Time:
Company:

Relinquished
Signature: Date:
Print Name: Time:
Company:

Received
Signature: [signature] Date: 7/28/95
Print Name: Doug McKenzie Time: 10:00A
Company: OAL

Shipped Via: Hand
Received @ 4 °C
Appropriate Containers ☑ Yes ☐ No

10 4oz./8oz. Jars
___ VOA Vials
___ Plastic Bottles
___ Glass Bottles
___ other ___

OSM009822

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: RJ DATE: 8/7/95
DATA PACK REVIEW BY: KMB DATE: 8/7/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	S-2A	S-2B	S-3Z	S-7A	S-7B
OAL ID: 25-I687-	39392	39393	39394	39395	39396
SAMPLE DATE:	7/28/95	7/28/95	7/28/95	7/28/95	7/28/95
MATRIX:	SOIL	SOIL	SOIL	SOIL	SOIL
EXTRACTION DATE:	8/2/95	8/2/95	8/2/95	8/2/95	8/2/95
ANALYSIS DATE:	8/2/95	8/2/95	8/2/95	8/2/95	8/2/95
HCID:	ND	ND	ND	ND	ND
HCID(CONTINUED):	.	.	.	.	.
SURR.RECOVERY %	119.	122.	101.	121.	87.
ANALYST:	RJ	RJ	RJ	RJ	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE ≤ 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: TMW DATE: 8/11/95

DATA PACK REVIEW BY: ALB DATE: 8/11/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

TOTAL METALS
EPA METHODS 6010 AND 7470

SAMPLE ID:		S-2A	S-2B	S-3Z	S-7A	S-7B
OAL ID: 25-I687-		39401	39402	39403	39404	39405
SAMPLE DATE:		7/28/95	7/28/95	7/28/95	7/28/95	7/28/95
DIGESTION DATE:		7/31/95	7/31/95	7/31/95	7/31/95	7/31/95
ARSENIC	PPM	3.6	3.67	3.7	1.5	1.9
BARIUM	PPM	74.5	84.6	79.8	92.3	74.0
CADMIUM	PPM	<0.2	<0.2	<0.2	<0.2	<0.2
CHROMIUM	PPM	14.7	17.1	15.2	7.43	11.3
LEAD	PPM	8.0	6.6	5.4	2.8	4.9
MERCURY	PPM	0.024	<0.02	<0.02	0.025	<0.02
SELENIUM	PPM	<5.0	<5.0	<5.0	<5.0	<5.0
SILVER	PPM	<0.3	<0.3	<0.3	<0.3	<0.3

NA = NOT ANALYZED

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: RJ DATE: 8/7/95
DATA PACK REVIEW BY: KWB DATE: 8/7/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	S-3H	S-3J	S-3I	S-3G
OAL ID: 25-I687-	39397	39398	39399	39400
SAMPLE DATE:	7/27/95	7/27/95	7/27/95	7/27/95
MATRIX:	SOIL	SOIL	SOIL	SOIL
EXTRACTION DATE:	8/2/95	8/2/95	8/3/95	8/2/95
ANALYSIS DATE:	8/2/95	8/2/95	8/3/95	8/2/95
HCID:	ND	ND	ND	ND
HCID(CONTINUED):	.	.	.	.
SURR.RECOVERY %	105.	92.	113.	104.
ANALYST:	RJ	RJ	RJ	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: TMW DATE: 8/11/95

DATA PACK REVIEW BY: AB DATE: 8/11/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

TOTAL METALS
EPA METHODS 6010 AND 7470

SAMPLE ID:		S-3H	S-3J	S-3I	S-3G
OAL ID: 25-I687-		39406	39407	39408	39409
SAMPLE DATE:		7/27/95	7/27/95	7/27/95	7/27/95
DIGESTION DATE:		7/31/95	7/31/95	7/31/95	7/31/95
ARSENIC	PPM	3.94	3.92	4.07	3.71
BARIUM	PPM	81.9	80.8	82.4	74.0
CADMIUM	PPM	<0.2	<0.2	<0.2	<0.2
CHROMIUM	PPM	15.9	16.1	16.5	14.5
LEAD	PPM	6.9	3.9	3.3	4.08
MERCURY	PPM	0.032	<0.02	0.024	<0.02
SELENIUM	PPM	<5.0	<5.0	<5.0	<5.0
SILVER	PPM	<0.3	<0.3	<0.3	<0.3

NA = NOT ANALYZED

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL Oregon Analytical Laboratory
14855 S.W. Old Scholls Ferry Rd.
Beaverton, Oregon 97007
(503) 590-5300
FAX (503) 590-1404

CHAIN OF CUSTODY RECORD
LABORATORY ANALYSIS REQUEST

Page 1 of 1

Client Information

Company: Century West
Contact: Alice Larsen
Address: 825 NE Multnomah Ste 925
PDX 97232
Phone #: _____ FAX #: _____

Project Name: Port - Surcharge Sampling
Project Number: 40036-101-01
P.O. Number: _____
Comments: BILL PORT

Sampler's Name: Alice Larsen
Signature: _____
Sampling Date: 7-27 7-28-95

Provide Verbal Results: ☒ Yes ☐ No
Provide FAX Results: ☒ Yes ☐ No

N - 2 weeks
S - 1 week
R - Rush
O - Other _____

	Sample Identification	Date	Time	TPH HCID OAL # 25-I687-	# of Containers	Matrix: Soil	Water	Other (Note in Remarks)	Analyses	Turnaround	Remarks
1	S-2A	7/28/95		39392	2				X		39401
2	S-2B	7/28/95		39393	2				X		39402
3	S-3K	/		39394	1				X		39403
4	S-7A	/		39395	2				X		39404
5	S-7B	/		39396	2				X		39405
6	S-3H	7/27/95		39397	2				X		39406
7	S-3J	/		39398	2				X		39407
8	S-3I	/		39399	1				X		39408
9	S-3G	/		39400	2				X		39409
10											

ANALYSES: Volatiles 624/8260 (circle) All Aromatic Halogenated; Semivolatiles 625/8270 (circle) All PAH/SIM Phenol Phthalate; Organochlorinateds 608/8080 All PCB Pesticide (circle); Chlorinated Herbicides 8150; TPH-HCID OR-DEQ Quantify? Yes No; TPH Quantification (circle) G D 418.1M; BTEX 602/8020; TCLP Metals (circle) As Ba Cd Cr Pb Hg Se Ag; TCLP Organics (circle) Vol Semivol Pest Herb; Metals Dissolved Total Ext RCRA 8

Relinquished
Signature: _____ Date: 7/28/95
Print Name: Alice J Larsen Time: 1625
Company: Century West

Received
Signature: _____ Date: _____
Print Name: _____ Time: _____
Company: _____

Relinquished
Signature: _____ Date: _____
Print Name: _____ Time: _____
Company: _____

Received
Signature: _____ Date: 7/28/95
Print Name: Doug McKenzie Time: 4:25P
Company: OAL

Shipped Via: Hand delivered
Received @ 4 °C
Appropriate Containers ☒ Yes ☐ No

X 4oz. 8oz. Jars
___ VOA Vials
___ Plastic Bottles
___ Glass Bottles
___ other _____

OSM009827

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: RJ DATE: 8/7/95

DATA PACK REVIEW BY: KMB DATE: 8/7/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	S-4A	S-4B	S-4C	S-4D	S-4E
OAL ID: 25-I687-	39428	39429	39430	39431	39432
SAMPLE DATE:	7/31/95	7/31/95	7/31/95	7/31/95	7/31/95
MATRIX:	SOIL	SOIL	SOIL	SOIL	SOIL
EXTRACTION DATE:	8/3/95	8/1/95	8/1/95	8/1/95	8/1/95
ANALYSIS DATE:	8/3/95	8/2/95	8/2/95	8/2/95	8/2/95
HCID:	ND	ND	ND	ND	ND
HCID(CONTINUED):	.	.	.	.	.
SURR.RECOVERY %	109.	116.	115.	112.	111.
ANALYST:	RJ	RJ	RJ	RJ	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: RJ DATE: 8/7/95
DATA PACK REVIEW BY: KMB DATE: 8/7/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	S-4Z
OAL ID: 25-I687-	39433
SAMPLE DATE:	7/31/95
MATRIX:	SOIL
EXTRACTION DATE:	8/1/95
ANALYSIS DATE:	8/2/95
HCID:	ND
HCID(CONTINUED):	.
SURR.RECOVERY %	109.
ANALYST:	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: [signature] DATE: 8/11/95

DATA PACK REVIEW BY: NB DATE: 8/11/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

TOTAL METALS
EPA METHODS 6010 AND 7470

SAMPLE ID:		S-4A	S-4B	S-4C	S-4D	S-4E
OAL ID: 25-I687-		39434	39435	39436	39437	39438
SAMPLE DATE:		7/31/95	7/31/95	7/31/95	7/31/95	7/31/95
DIGESTION DATE:		8/3/95	8/3/95	8/3/95	8/3/95	8/3/95
ARSENIC	PPM	1.5	1.7	1.6	1.5	1.4
BARIUM	PPM	55.2	59.8	49.7	49.4	56.4
CADMIUM	PPM	<0.2	<0.2	<0.2	<0.2	<0.2
CHROMIUM	PPM	10.6	11.8	12.1	8.88	13.8
LEAD	PPM	<2.5	<2.5	<2.5	<2.5	3.2
MERCURY	PPM	<0.02	<0.02	<0.02	<0.02	<0.02
SELENIUM	PPM	<5.0	<5.0	<5.0	<5.0	<5.0
SILVER	PPM	<0.3	<0.3	<0.3	<0.3	<0.3

NA = NOT ANALYZED

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: [signature] DATE: 8/11/95

DATA PACK REVIEW BY: NB DATE: 8/11/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

TOTAL METALS
EPA METHODS 6010 AND 7470

SAMPLE ID:		S-4Z
OAL ID: 25-I687-		39439
SAMPLE DATE:		7/31/95
DIGESTION DATE:		8/3/95
ARSENIC	PPM	1.5
BARIUM	PPM	50.4
CADMIUM	PPM	<0.2
CHROMIUM	PPM	9.75
LEAD	PPM	<2.5
MERCURY	PPM	<0.02
SELENIUM	PPM	<5.0
SILVER	PPM	<0.3

NA = NOT ANALYZED

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL Oregon Analytical Laboratory

14855 S.W. Old Scholls Ferry Rd.
Beaverton, Oregon 97007
(503) 590-5300
FAX (503) 590-1404

CHAIN OF CUSTODY RECORD
LABORATORY ANALYSIS REQUEST

Client Information

Company: Century West
Contact: Alice Larsen
Address: 825 NE Multnomah Ste 425
PDX 97232
Phone #: 231-6078 FAX #: 231-6842

Project Name: Port - Surcharge Sampling
Project Number: 40038-101-01
P.O. Number:
Comments: BILL PORT
ATTN PAD QUINN

Sampler's Name: Alice Larsen
Signature: [signature]
Sampling Date: 7/31/95

Provide Verbal Results ☒ Yes ☐ No
Provide FAX Results ☒ Yes ☐ No

Turnaround: (N - 2 weeks) S - 1 week R - Rush O - Other

	Sample Identification	Date	Time	TPH HCID OAL # 25. I687.	# of Containers	Matrix: Soil	Matrix: Water	Matrix: Other (Note in Remarks)	Volatiles 624/8260 (circle) All Aromatic Halogenated	Semivolatiles 625/8270 (circle) All PAH(SIM) Phenol Phthalate	Organochlorinateds 608/8080 All PCB Pesticide (circle)	Chlorinated Herbicides 8150	TPH-HCID OR-DEQ Quantify? Yes No	TPH Quantification (circle) G D 418.1M 418.1	BTEX 602/8020	TCLP Metals (circle) As Ba Cd Cr Pb Hg Se Ag	TCLP Organics (circle) Vol Semivol Pest Herb	Metals ☐Dissolved ☐Total list 8 RCRA				Turnaround	25 Remarks I687 metals
1	S-4A	7/31/95		39428	2	✓							X					X					39434
2	S-4B			39429	2								X					X					39435
3	S-4C			39430	1								X					X					39436
4	S-4D			39431	2								X					X					39437
5	S-4E			39432	2								X					X					39438
6	S-4Z			39433	1								X					X					39439
7																							
8																							
9																							
10																							

Relinquished
Signature: [signature] Date: 7/31/95
Print Name: Alice J Larsen Time:
Company: Century West

Received
Signature: Date:
Print Name: Time:
Company:

Relinquished
Signature: Date:
Print Name: Time:
Company:

Received
Signature: [signature] Date: 7/31/95
Print Name: Doug McKenzie Time: 12:15P
Company: OAL

Shipped Via: Hand Delivered
Received @ 4 °C
Appropriate Containers ☒ Yes ☐ No

X 4oz./(8oz.) Jars
___ VOA Vials
___ Plastic Bottles
___ Glass Bottles
___ other

OSM009832

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: RJ DATE: 8/1/95
DATA PACK REVIEW BY: KMB DATE: 8/1/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	S-6A	S-6B	S-5A	S-5B	S-3A
OAL ID: 25-I687-	39248	39249	39250	39251	39252
SAMPLE DATE:	7/26/95	7/26/95	7/26/95	7/26/95	7/26/95
MATRIX:	SOIL	SOIL	SOIL	SOIL	SOIL
EXTRACTION DATE:	7/28/95	7/28/95	7/28/95	7/28/95	7/28/95
ANALYSIS DATE:	7/30/95	7/30/95	7/30/95	7/30/95	7/30/95
HCID:	ND	ND	ND	ND	ND
HCID(CONTINUED):	.	.	.	.	.
SURR.RECOVERY %	114.	110.	111.	108.	114.
ANALYST:	RJ	RJ	RJ	RJ	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: RJ DATE: 8/1/95

DATA PACK REVIEW BY: JD DATE: 8/1/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	S-3B	S-3C	S-3D	S-3E	S-3F
OAL ID: 25-I687-	39253	39254	39255	39256	39257
SAMPLE DATE:	7/26/95	7/26/95	7/26/95	7/26/95	7/26/95
MATRIX:	SOIL	SOIL	SOIL	SOIL	SOIL
EXTRACTION DATE:	7/28/95	7/28/95	7/28/95	7/28/95	7/28/95
ANALYSIS DATE:	7/30/95	7/30/95	7/30/95	7/30/95	7/30/95
HCID:	ND	ND	ND	ND	ND
HCID(CONTINUED):	.	.	.	.	.
SURR.RECOVERY %	103.	109.	122.	109.	125.
ANALYST:	RJ	RJ	RJ	RJ	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: TMW DATE: 8/11/95

DATA PACK REVIEW BY: NB DATE: 8/11/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

TOTAL METALS
EPA METHODS 6010 AND 7470

SAMPLE ID:		S-6A	S-6B	S-5A	S-5B	S-3A
OAL ID: 25-I687-		39258	39259	39260	39261	39262
SAMPLE DATE:		7/26/95	7/26/95	7/26/95	7/26/95	7/26/95
DIGESTION DATE:		7/31/95	7/31/95	7/31/95	7/31/95	7/31/95
ARSENIC	PPM	1.8	1.0	1.5	1.3	4.00
BARIUM	PPM	43.1	90.8	65.9	83.8	79.8
CADMIUM	PPM	<0.2	<0.2	<0.2	<0.2	<0.2
CHROMIUM	PPM	10.3	13.6	13.7	22.0	17.2
LEAD	PPM	3.5	5.0	3.3	4.0	5.6
MERCURY	PPM	0.020	0.023	<0.02	0.022	0.021
SELENIUM	PPM	<5.0	<5.0	<5.0	<5.0	<5.0
SILVER	PPM	<0.3	<0.3	<0.3	<0.3	<0.3

NA = NOT ANALYZED

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL

CENTURY WEST ENGINEERING
825 NE MULTNOMAH, SUITE 425
PORTLAND, OR 97232

ANALYST REVIEW BY: 8/11/95 TMW DATE: 8/11/95

DATA PACK REVIEW BY: NB DATE: 8/11/95

ALICE LARSEN
231-6078FAX 231-6482
R001322/40038-101-01

TOTAL METALS
EPA METHODS 6010 AND 7470

SAMPLE ID:		S-3B	S-3C	S-3D	S-3E	S-3F
OAL ID: 25-I687-		39263	39264	39265	39266	39267
SAMPLE DATE:		7/26/95	7/26/95	7/26/95	7/26/95	7/26/95
DIGESTION DATE:		7/31/95	7/31/95	7/31/95	7/31/95	7/31/95
ARSENIC	PPM	3.65	2.9	2.9	3.2	3.97
BARIUM	PPM	69.7	71.2	54.5	80.8	83.8
CADMIUM	PPM	<0.2	<0.2	<0.2	<0.2	<0.2
CHROMIUM	PPM	17.5	11.8	11.8	13.4	18.0
LEAD	PPM	6.4	5.3	2.7	5.9	6.0
MERCURY	PPM	0.021	0.023	0.021	0.036	0.023
SELENIUM	PPM	<5.0	<5.0	<5.0	<5.0	<5.0
SILVER	PPM	<0.3	<0.3	<0.3	<0.3	<0.3

NA = NOT ANALYZED

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-590-5300 • Fax 503-590-1404

OAL Oregon Analytical Laboratory
14855 S.W. Old Scholls Ferry Rd.
Beaverton, Oregon 97007
(503) 690-5300
FAX (503) 690-1404

CHAIN OF CUSTODY RECORD
LABORATORY ANALYSIS REQUEST

Page 1 of ___

Client Information

Company: Century West
Contact: Alice Larsen
Address: 825 NE Multnomah Ste 425, PDX, OR 97232
Phone #: 231 6078 FAX #: 231 6482

Project Name: Part - Surcharge Sample
Project Number: 40038-101-01
P.O. Number:
Comments: BILL PORT DIRECTLY

Sampler's Name: Alice Larsen
Signature:
Sampling Date: 7/26/95

Provide Verbal Results ☑ Yes ☐ No
Provide FAX Results ☑ Yes ☐ No

Sample Identification	Date	Time	HCID OAL # 25-I687-	# of Containers	Matrix: Soil	Matrix: Water	Matrix: Other (Note in Remarks)	Analyses	Turnaround	Remarks
1 S-6A	7/26/95		39248	2				TPH-HCID OR-DEQ Quantify? Yes No: X; Metals Dissolved Total: X		39258
2 S-6B			39249	2				X; X		39259
3 S-5A			39250	2				X; X		39260
4 S-5B			39251	2				X; X		39261
5 S-3A			39252	2				X; X		39262
6 S-3B			39253	2				X; X		39263
7 S-3C			39254	1				X; X		39264
8 S-3D			39255	2				X; X		39265
9 S-3E			39256	2				X; X		39266
10 S-3F			39257	2				X; X		39267

Turnaround: W - 2 weeks; S - 1 week; R - Rush; O - Other

Relinquished		Received	
Signature:	Date: 7-27-95	Signature:	Date: 7.27.95
Print Name: Alice J Larsen	Time: 9:57	Print Name:	Time: 9:51
Company: Century West		Company: OAL	

Relinquished		Received	
Signature:	Date:	Signature:	Date:
Print Name:	Time:	Print Name:	Time:
Company:		Company:	

Shipped Via: Hand
Received @ 4 °C
Appropriate Containers ☑ Yes ☐ No

19 4oz. (8oz) Jars
___ VOA Vials
___ Plastic Bottles
___ Glass Bottles
___ other

OSM009837